

## BUILDING FAÇADE – RATIONALISM AND INTUITION IN THE SELECTION OF CLADDING MATERIALS

### ELEWACJA BUDYNKU – RACJONALIZM A INTUICJA W DOBORZE MATERIAŁÓW FASADOWYCH

#### Abstract

Until relatively recently, the architect had a choice. The designer was able to decide whether the wall of the building with which the user has contact should give information about the manner of its construction. The creator could express the truth about the construction and erection of the building or hide it under cladding. Ages, styles as well as trends in architecture approached this issue differently, but at least in theory the artist had a choice.

Today, it is very limited. Contemporary rational requirements for energy efficiency are imposed by layered solutions for external walls. This results in leading functions being assigned to each layer. What we see on the façade is usually the cladding that hides the structures and insulation materials. Although there are exceptions to this rule, it can be assumed that rationalism related to energy efficiency and the regulations that follow it limit the freedom of design choices. In the context of these limitations, as well as various other criteria which guide the creator as part of the design process, the decision concerning the choice of facade material for a composite wall seems to be particularly interesting. Is this decision intuitive or rational? What are the reasons for choosing the final solution?

*Keywords: architecture, architectural expression, façade cladding materials*

#### Streszczenie

Jeszcze stosunkowo niedawno architekt miał wybór. Mógł podjąć decyzję, czy ściana budynku, z którą użytkownik ma kontakt, informuje o sposobie jej budowania. Projektant mógł wyrazić prawdę o sposobie konstrukcji i wznoszenia obiektu lub też ukryć ją pod okładziną. Epoki, style i trendy w architekturze różnorodnie podchodziły do tego zagadnienia, tym niemniej przynajmniej teoretycznie twórca miał wybór.

Dziś jest on znacznie ograniczony. Współczesne racjonalne wymagania związane z energooszczędnością narzucają rozwiązania warstwowe dla przegród zewnętrznych. Skutkuje to przypisaniem poszczególnym warstwom funkcji wiodących. To, co oglądamy na elewacji, jest zwykle okładziną skrywającą konstrukcję i materiały izolacyjne. I choć bywają wyjątki od tej zasady, w pewnym uproszczeniu można przyjąć, że racjonalizm związany z energooszczędnością i idące za nim przepisy ograniczają swobodę wyborów projektowych. W kontekście tych ograniczeń, jak również innych różnorodnych kryteriów, którymi twórca kieruje się w ramach procesu projektowego, szczególnie interesująca wydaje się decyzja dotycząca wyboru materiału elewacyjnego ściany warstwowej. Na ile jest ona racjonalna, a na ile intuicyjna? Jakie przesłanki stoją za wyborem tego, a nie innego rozwiązania?

*Słowa kluczowe: architektura, wyraz architektoniczny, materiały elewacyjne*

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## 1. Introduction

*Le Corbusier defined architecture as 'the mastery, correct and magnificent play of volumes brought together in light,' but what we actually see when we look at a building is its skin. Whether it is the painted stucco of the Villa Savoye, the veined white marble of the Eolger Library, the bronze and glass of the Seagram Building, or the matte-gray stainless steel of the Yale Centre for British Art, it is the skin that makes the first impression. Building skins are a modern concept. Although the Romans built concrete buildings with brick or stone veneers, most traditional construction was monolithic: a single material such as brick, stone, adobe, or timber (in the case of log cabins) served as both structure and skin.*

Witold Rybczyński<sup>1</sup>

In most modern exterior walls, the structure of the building and its surface are separated. The wall is composed of several layers. Energy efficiency requirements determine the presence of thermal insulation in walls other than glass. It usually covers the structure and requires an outer layer to hide it.

The designer makes the choice of the façade material regardless of the structural decisions. This seems to give more freedom of choice. When selecting facade material, the designer makes two types of decisions – rational and intuitive – which require definition at the beginning.

The author understands rational decisions as those related to questions to which the answer is relatively clear – about costs, thermal insulation of facade material, about the influence of atmospheric factors on the surface, about how the material “behaves” over the years.

Those that are intuitive refer to the architectural expression of a building, where the choice is made on the basis of added value, the “over-programming” role of the façade not related only to its functionality. And material, although generally it is only one of the components of architectural expression, is becoming decisive. These decisions, which are partly based on knowledge and experience, also have a component of uncertainty. It is not known whether the designer’s intentions will be recognized.

This article is an attempt to read these intentions and answer the question of why designers choose selected facade materials and what message the outer layer of the wall can carry with it.

## 2. Material – aesthetics, impression, individuality

The façade material is only one of the components of architectural expression, but in many cases it is very important. The first premise of the choice, which seems to be the most obvious and intuitive, is the aesthetics of the solution. This is determined by the structure, texture and colour of the material, the size and method of fixing the elements, as well as the exceptionality and individuality, which attract the eye and distinguish the building from the neighbourhood.

This role of façade material is particularly visible in the architecture of buildings which aim to be highly energy efficient and “ahead of” the existing regulations and guidelines. The rules of construction of passive (or even zero-energy) buildings are restrictive (e.g. the compact shape

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<sup>1</sup> W. Rybczyński, *Jak działa architektura. Przybornik humanisty*, Wydawnictwo Karakter, Kraków 2014/ Rybczyński W., *How Architecture Works: A Humanist's Toolkit*, Farrar, Straus and Giroux, New York 2013.



of the building limiting the number of corners and the surface of external walls, minimizing the number of openings from the north, large glazing from the south, separate balcony construction) and thus their shapes are similar to each other, and the selection of facade material is one of the few creative acts in which the architect can afford to make intuitive decisions.

Residential buildings in sustainable housing estates such as the energy-saving houses in Vauban, Freiburg im Breisgau, or the passive ones of the final stage of the BO01 development in Malmö, Sweden (designed by KK Architecture) are simple, compact and very similar. What distinguishes them from the neighborhood is their diverse facade materials<sup>2</sup>.

The materials 'responsible' for architectural expression are the characteristic features of buildings with simple shapes. They can be found more often in the architecture of multi-family residential buildings than in other types of buildings. For example, the buildings at the Amerika Plads in Copenhagen. The square is located in the district of Østerbro, which was built as a result of the revitalization of the former port and its transformation into a multifunctional housing estate with a major residential function. Ill. 1 shows buildings erected in the close vicinity with similar dimensions and divisions of the facade, probably also the structure. They can be distinguished mainly by their individual facade materials (ceramic, sheet metal, plaster), which give each house a different architectural expression.

The way in which a building's appearance and reception may change under the influence of various materials on its surface is perfectly illustrated by a domestic example – the complex of buildings of the Museum of Mazovian Village in Sierpc (designed by Consultor Architekci and Ahor – Anita Horowska). The building, or in fact three buildings with very similar forms, connected under green slopes, were differentiated by three facade materials – wood, slate and ceramics (Ill. 2).

If the authors of the project had decided to use only one facade material in all three parts, it would have been possible to create an attractive object, but certainly different in character and aesthetics.

It is also worth mentioning the example of a building with a non-residential function, the final architectural expression of which is also achieved by its characteristic and unique facade material. An example is the Wolf Bracka shopping and service centre (also called Vitkac). The building (designed by Kuryłowicz & Associates) was constructed in 2008–2011 at the corner of Bracka and Nowogrodzka Streets in Warsaw.

Although the building impresses with its soft mass and facade divisions, it builds the first impression of passers-by, mainly with its facade material – rough, dark, almost black, Brazilian granite (Ill. 3).

The elegant, dignified and spectacular material, in a colour contrasting with the surroundings, determines the perception of the building, which – probably intentionally – arouses associations with elegance and luxury.

### **3. The material tells and informs**

The European Solidarity Centre completed in 2014 in Gdańsk (designed by PPW Fort) attracts attention with its rusty surfaces of corten steel. The dominant facade material is

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<sup>2</sup> <http://www.kjellgrenkaminsky.se/en/blog/portfolio/salongen-35/>.





- III. 1. Buildings at the Amerika Plads in Copenhagen,  
 III. 2. New buildings of the Museum of Mazovian Village in Sierpc  
 III. 3. Wolf Bracka shopping and service centre in Warsaw

reminiscent of the ship's hull built on a ramp. Thus, they inform about the history of the place (the shipyard), and recall the industrial, but also socio-political, past of the place. The austerity of the steel panels covering the walls of the building is linked to the past and to the industrial landscape<sup>3</sup>.

The architect W. Targowski, the creator of the building, explained the use of façade material in this way: *I visited the shipyard while it was still operational. I remembered a large storage site of raw steel plates based on racks, prepared for installation. It was a huge,*

<sup>3</sup> <http://architektura.muratorplus.pl/zycie-w-architekturze/2015/europejskie-centrum-solidarnosci/1159/>.



*dynamic sculpture with a finished composition, almost like the monumental works of Richard Serra. A sequence of transverse, corten-covered walls of a building is a copy of that memory. I wanted to include in the architecture the simple music that I remembered from that place – the rhythmic sound of work*<sup>4</sup>.

The story about the history of the place in the elevation of the building can be much more literal. Concrete is a material that allows for the transfer of drawings, paintings or photographs (using photogravure technology) on its surface. Thanks to the features of concrete and its processing, the façade can be transformed into a picture gallery.

The façade of the student house in Montreal (designed by the Kanva design studio) was decorated with concrete panels with images of the city from more than 100 years ago. In this way, the elevation tells a story, and the building itself manifests its devotion to the place<sup>5</sup>.

Between 2010 and 2015, the Fire Museum<sup>6</sup> in Żory, designed by OVO Grąbczewscy, was erected. The elevation of the building “burns” like a torch. This is due to the quite expressive form that can bring to mind flames, but also, if not primarily, thanks to the façade material. The outer cladding of the building is made of copper plates with a golden orange colour, which are quite clearly associated with fire, especially in night lighting. The façade “introduces” the visitors to the function of the object before they even cross its threshold.

Concrete, mentioned in the context of the Montreal student house, which is “a stone that can be cast in moulds”<sup>7</sup> is an extremely well adapted material for the information function of the façade.

In the Dutch Enschede, in 2016 the Jan Cremer Museum, designed by SeArRCH and Rem Koolhaas, was completed. The museum is located in a rebuilt old warehouse.

The brick walls of the existing building were partly demolished and supplemented with glazing to illuminate the exhibition space. However, the façade is dominated by old brick, supplemented in large part by new concrete slabs of a similar colour. Each of the three types of façade surfaces provides different information: brick indicates the former function and age of the building, glass shows that the function has changed, and concrete slabs explain who the patron of the object is<sup>8</sup>.

Dark red concrete slabs are reliefs presenting a man on a motorbike. The cover of Cremer’s first book with his photograph was the model for this pattern. It is known and the photograph itself is recognizable (the novel was very popular and 12 million copies were sold).

Just as in the Dutch building, the concrete façade informs about the function of the object on the façade of the Berlin Museum of Architectural Drawing, erected in 2013 according to the design of SPEECH Tchoban & Kuznetsov office<sup>9</sup>.

The shape of the building is made up of five massive blocks, shifted in relation to each other, resembling piles of paper or a cabinet with open drawers, in which architeconic drawings are stored. The four lower blocks have concrete facades and the top block is a glass storey. The

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<sup>4</sup> W. Targowski, *Rozmowa z Wojciechem Targowskim, autorem Centrum Solidarności w Gdańsku*, Architektura-murator nr 2/2015.

<sup>5</sup> <https://www.reckli.com/en/blog/article/history-cast-into-concrete/>.

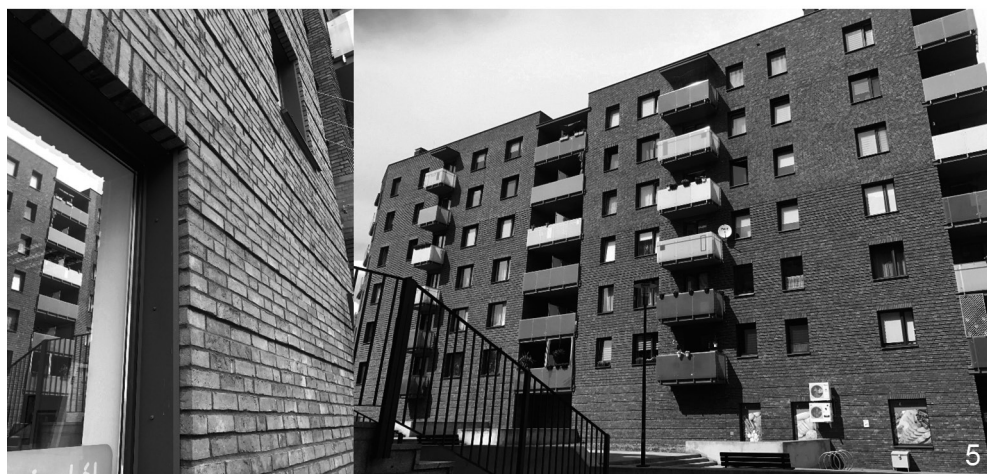
<sup>6</sup> <http://www.ovo-grabczewscy.pl/projects/museum-of-fire-in-%C5%BCory>.

<sup>7</sup> D. Kozłowski, *Beton surowy w architekturze lat 60. i pięćdziesiąt lat później*, Czasopismo Techniczne, 3-A, Kraków 2011.

<sup>8</sup> <https://www.reckli.com/en/blog/article/concrete-art-in-the-third-dimension/>.

<sup>9</sup> <https://www.reckli.com/en/blog/article/blueprints-for-a-museum/>.





III. 4. Children's Hospital at Kopernika Street in Warsaw

III. 5. Communal residential buildings at Jagiellońska Street in Warsaw (photos. A. Tofiluk)

concrete parts of the façade are reliefs depicting scaled-up architectural drawings. Repeated patterns overlap like sheets of paper. The impression that the façade represents the architect's work is enhanced by the yellow-grey colour of the concrete, similar to the colour of the old paper.

The relief pattern, made to order, gives the heavy blocks a certain lightness. Thanks to the structure pressed in the coloured concrete, the façade becomes a medium of information about the function of the building and the expositions presented in it.

In Bregenz (Austria), the new building of the Vorarlberg Museum was completed in 2012, and its designers were Cukrowicz Nachbaur & Architekten ZT.

Here, too, the possibilities offered by the concrete shaping allowed the facade to inform about the purpose of the building, but in a slightly more ambiguous way.



Originally, a different shape of concrete was planned for the façade. In the end, it was decided to sculpt the smooth surface with convex shapes similar to flower cups. Viewing these elements, the viewer realizes that it is a familiar form, although it is difficult to associate its origin at first sight<sup>10</sup>.

The architects, together with the South Tyrol artist Manfred Alois, were inspired by the museum collections, which include old objects of everyday use. Their façade flowers took the form of PET bottle bases – contemporary equivalents of the exhibits.

It seems that among Polish buildings there are not many that use concrete on the façade as a way of informing about the function of the building.

A graceful and subtle example is a fragment of the façade of the extended Children's Hospital at Kopernika Street, designed by Chmielewski Skala Architekci (completed in 2015).

A fragment of the façade is covered with children's drawings pressed in concrete (the rest of the façade is covered with Portuguese limestone cladding), which indicates that it is an object designated for the youngest (Ill. 4).

#### **4. The material and the context**

In 2015, a new administration and office building for the Evangelical Lutheran Regional Church of Bavaria was built in Munich (project by W. Lorch and T. Wandel).

The building was built on the site of a demolished, much smaller building – a tenement house dating back to 1929. It is located in the central Maxvorstadt district on Katharina von Bora Street, on which there are historical buildings as well as contemporary ones. The neighborhood obliged designers to fit in with the place harmoniously and with respect for the achievements of their predecessors.

The architects focused on transforming the features of the demolished building into a new façade, whose composition and divisions, and in addition the window frames, refer to historical patterns. At the same time, the way the elevation is finished with concrete slabs gives the building a very contemporary character.

The concrete cladding panels are not flat. The multi-edged motif is three-dimensional. In addition to the visible pattern, the façade is influenced by the play of light and shadow, which exposes the geometric divisions of the wall. It seems that such a sculptured surface was inspired by traditional rustication<sup>11</sup>.

The concrete slabs, designed and made especially for this project, harmonise the building with other surrounding houses built at different times. At first glance, they let us classify the building as modern but at the same time respectful of the historical neighbourhood and the past of the place.

The Nottingham Contemporary in Nottingham was built in 2009. Its authors are Caruso St John Architects. The building was constructed in the Lace Market district. It is the area considered to be the oldest part of the city.

In the times of the British Empire, it was the world centre of the lace industry. Today, it is mainly a residential area – former halls and warehouses were converted into apartments. Most of the buildings were built of red brick with typical Victorian decorations.

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<sup>10</sup> <https://www.reckli.com/en/blog/article/a-sea-of-blossoms/>.

<sup>11</sup> <https://www.reckli.com/en/blog/article/multi-edged-folding-wonder/>.



The new building is very contemporary in form, contrasting with the old buildings of the district but referring to the place and history in its details.

The building facades are composed of three types of surfaces: dark concrete slabs in plinth walls; prefabricated concave concrete elements in jadeite colour in the central parts of the facades; and – the highest – golden aluminium parts.

The grey-green concrete elements are fully or partially decorated with a lace pattern, which is formed in the concrete. The architects chose a historical theme to recall the district's past and probably also to add lightness and elegance to the rather heavy façade. The lace on the wall surprises with its subtlety in comparison with the material it was made of<sup>12</sup>.

The New Nordpark Railway Stations in Innsbruck (in use since 2007) were designed by Zaha Hadid.

The station roofs are bent glass moulds. Their smooth shapes resemble the natural form of a glacier. No material other than glass would be more suitable as an imitation of ice, which is crucial to the inclusion of the railway objects in the character of an alpine town<sup>13</sup>.

Among the analysed Polish projects, in which the selection of facade material is determined by the context of the place, ceramic solutions are the most common.

The NOSPR (National Polish Radio Symphony Orchestra) building in Katowice (Konior Studio project, 2012–14) refers to the Silesian construction tradition with its brick facade<sup>14</sup>. The author himself says about the project: *The simple, recognizable from a long perspective, shape of the NOSPRSO evokes Silesian associations. The outer facades are made of brick. Thanks to this, the new building, together with the renovated brick buildings of the Katowice mine, creates a harmonious combination of history and modernity. The characteristic red finishes of the window niches, over a metre deep, are inspired by Nikiszowiec, the Silesian architectural icon*<sup>15</sup>

Similarly, the new communal residential buildings of the Kontrapunkt studio fit into the architecture of brick tenement houses on the right bank of Warsaw.

One of them is the building called the “House at the Sedum” on the corner of Białostocka and Grodzieńska Streets, others were built at Jagiellońska Street (Ill. 5). Their brick facade also conducts a dialogue with the remains of the nearby Śliwiński Fort (part of the Warsaw Citadel).

Fernando Menis, the designer of the Jordanian Cultural and Congress Centre in Toruń, also referred to the brick houses in the façade of his building. But his idea was less literal than the brick cladding.

Erected in 2013–2015, the building uses a material specially made for its façade. Part of the elevation (as well as the interior) is finished with a conglomerate of concrete and crushed brick<sup>16</sup>. This gives an original and modern look, which is at the same time a tribute to local tradition.

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<sup>12</sup> <https://www.reckli.com/en/blog/article/museum-in-a-lace-dress/>.

<sup>13</sup> [http://www.propertydesign.pl/architektura/104/kosmiczna\\_kolejka\\_linowa\\_swietuje\\_urodziny\\_projekt\\_zaha\\_hadid\\_architects\\_wciaz\\_zachwyca,16114.html](http://www.propertydesign.pl/architektura/104/kosmiczna_kolejka_linowa_swietuje_urodziny_projekt_zaha_hadid_architects_wciaz_zachwyca,16114.html).

<sup>14</sup> <http://sztuka-architektury.pl/article/4178/siedziba-nospr-gotowa>.

<sup>15</sup> T. Konior, *Brzmienie betonu – doświadczenia architekta*, [in:] *Prefabrykacja betonowa i beton komórkowy w nowoczesnym budownictwie*, red. J. M. Kostrzewski, A. Głębocka, SPB, Warszawa 2017.

<sup>16</sup> <http://www.bryla.pl/bryla/7,85301,20232953,30-tys-metrow-betonu-i-2-miesiace-badan-laboratoryjnych-centrum.html>.



## 5. Summary

Architect's choices of façade material, made through the perspective of aesthetics, inclusion of an object in the context and its information, should be considered as intuitive decisions, which does not mean that they are free of reflection and analysis.

They do not result from technical requirements or regulations, but from the desire to create something more than just a functional object used for the planned purpose. They complete rational design. Without intuition, architecture could have existed, but its impact would be much poorer.

The problem of choosing facade material is only one of many that the architect has to face, but it clearly shows that rationalism and intuition must complement each other if good architecture is to be the goal.

The functionality of architectural solutions is achieved through rational premises and unique expression through intuitive design decisions.

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